**Agency Performance Measures Committee**

**Performance Measures Workshop**
**Tuesday, October 23, 2007, Delta Room**

**Attendees:**

| Name: | Organization: | Name: | Organization: |
|---|---|---|---|
| Carl Wilcox | DFG | Joe Grindstaff | CALFED |
| Diane Buzzard | USBR | Michael Healey | CALFED |
| Bart Prose | USFWS | Lauren Hastings | CALFED |
| Carolyn Yale | SWRCB | Wendy H-Martin | CALFED |
| Donna Garcia | USBR | Jack Keller | ISB |
| Claire Jacquemin | USBR | Duncan Patten | ISB |
| Tina Cannon Leahy | DFG | Bill Glaze | ISB |
| Neil Clipperton | DFG | Sam Luoma | USGS |
| Dave Spath | DHS | Judith Meyer | ISB |
| Paul Massera | DWR | Bill Burkhard | DWR |
| Mike Mirmazaheri | DWR | Thomas Jabusch | SFEI |
| Karen Larsen | SWRCB | Sam Ziegler | USEPA |
| Steve Detwiler | USFWS | Maury Kruth | USBR |
| Lauren Hastings | CALFED | Matt Nobriga | CALFED |
| Elizabeth Soderstrom | CALFED | Darcy Jones | CALFED |
| John Ryan | CALFED | Anitra Pawley | Stillwater Sciences |
| Bill Foster | CALFED | Victoria Poage | USFWS |
| Don Crocker | CALFED | Tina Swanson | The Bay Institute |
| Elise Shepard | CALFED | | |
| Kurt Malchow | CALFED | | |

**Abbreviations:**
PM – Performance Measure
ISB – CALFED Independent Science Board
ROD – CALFED Record of Decision
ERP – CALFED Ecosystem Restoration Program
ELPH – Equivalent Level of Public Health
TOC – Total Organic Carbon
SJR - San Joaquin River
DRERIP – Delta Regional Restoration Implementation Plan
KIM – Kilo-Inch Mile
RKIM – Risk-adjusted Kilo-Inch Mile

**Keynote Address: Joe Grindstaff**
It is critical to not only be able to track how CALFED funds are spent, but also to report impact. Recently, Susan Kennedy, chief of staff for Governor Schwarzenegger, requested budget figures from CALFED and was pleased that we could deliver them – she called the CALFED staff involved in this effort "the white knights." This information is important for public policy and for acquiring additional funding; it is the most important thing that we can do in terms of our financial future.

**Long-Term Vision for Performance Measures: An Adaptive Management Framework for CALFED: Michael Healey**

- We need to be in a position to report to the public what impact they received for their money. If we do not have performance measures, it is like driving with a blindfold and waiting until you hit something. With performance measures, you can drive the car/state much more efficiently and make corrections as you go along.
- PMs can be an area of confusion.
- It is important to remember that PMs assess projects, not individuals. PMs are preventive, helping you discover impact as you move forward and decide if your policy is working as intended.
- In the best of all worlds, PMs are determined at the outset of a project or program.
- Monitoring, analysis and evaluation are critical components for an adaptive process.

Adaptive management cycle:

- Adaptive management begins with the definition of the problem. More data provides a better definition of the problem, and conceptual models provide a framework for our perception of how the issues at hand behave.
- The next step is to define policies to address the problem. There is a tight relationship between conceptual models, assessments, and monitoring to learn if the conceptual models are correct.
- In today's world, we must use the benefits of an adaptive process. We need to have the monitoring data in place and then do policy reviews and evaluation. A policy assessment can operate at different levels within the organization. Assessments get more detailed as you move through the organization.
- Paradox: There is a reluctance to engage in PMs, including a lack of support from senior decision makers, unless there is a crisis, in which case they wonder why there aren't any PMs.

**Definitions – Framework and Conceptual Models: Lauren Hastings**

- Indicators tell us about something else (example: taking a temperature tells us if a patient is ill). They document change in a system.
- Indicators can be specific or qualitative.
- Indicators are measurable (data and monitoring are needed).
- CALFED has identified three levels of performance measures, but it is important to avoid getting hung up on terms (indicator vs. performance measure).
- Performance measures are embedded with the adaptive management framework. The first step is to identify strategic goals, then develop performance goals, and

finally develop outcome indicators. The next step is to identify what data is needed to determine performance.

Conceptual Models:

- Should be based on scientific knowledge
- Must be explicit
- Must provide references
- Can describe the link between drivers and outcomes
- Can be a basis of discussion for expected outcomes

**Discussion following first two presentations:**

- D. Patten: The topic of monitoring falls through the cracks. Discuss why we monitor rather than why we use indicators and PMs.
- J. Meyer: Conceptual models enter the picture too late in the PM cycle graph. Conceptual models should be used to do more than decide what to monitor.

**Overview of Phase ll: Elizabeth Soderstrom**

It is envisioned that Phase II of the PM effort will have four components:

1. Administrative/Output Performance Measures
2. Outcome Performance Measures
3. Reporting. We plan on producing the First Annual CALFED Performance Measures Report in spring 2008. This report will include reporting on a small number of initial outcome performance measures. In addition, it will report on CALFED administrative and output PMs for some of the largest CALFED projects. In this report, we will not attempt to make linkages between these funded projects and outcomes.
4. Integration. In this report, we will also address both horizontal (across programs) and vertical (from output to outcomes) integration.

There will be a subset of two or three PMs per subgroup, each broken down into a different work plan. This is an agency-led effort with ISB input from the initial phases to adaptive management. The intent is to make this process more sustainable over time. One role for this effort would be for the ISB to help us to tell the story behind the trends we see with the outcome performance measures. We will soon drop the phasing of this effort, as CALFED is too fluid for this approach. For example, under the phased approach, it was originally envisioned that Phase III would involve developing a full-suite of performance measures, but instead Phase III might involve identifying drivers or intermediate outcomes and reporting on these. We will not know that until we get there.

**Discussion:**

- C Yale: Where does monitoring fit in with PMs? E Soderstrom: Sam Luoma will address that in his presentation.
- T. Cannon: We need a solid foundation and approach. Big decisions are being made that are based on the current approach not working. This effort may now be too late. How will our process fit in with these changes?

- L. Hastings: We are too late or too early. No PMs were identified up front, so there was no pre-project monitoring. In that way, we are too late, but we might be ahead of the game for the next phase of CALFED. It is important to keep making progress.
- D. Patten: What about the 119 milestones outlined in the ROD? They are PMs. Are they separate from this effort?
- L. Hastings: For the next phase, we will have PMs based on a better documented scientific basis. The 119 milestones were linked to the ERP, but also included eco-water quality. They are output components. There is also a drinking water quality final assessment out today. We should table the discussion on the relationship this has with the milestones during the breakout sessions.

**Performance Measures Subgroups: Where We Are and How We Got There:**

(Please see presentation slides for content at: http://www.calwater.ca.gov/performancetracking/Workshops/2007/Oct/PM_Workshop_Presentation_10-23-07.pdf. The notes below pertain to the discussion following the presentations)

1. **Water Quality:** (No immediate discussion)
2. **Ecosystem restoration:** Each of the basic goals has its own plan. All key species have existing data sources. An information gap exists with the conceptual models for these species; drafts are in place.
3. **Water Supply Reliability:** We wanted something immediately implementable, based on delivery reliability with standards and requirements. We did not address beneficial uses. These are not quantified. Will implement all three PMs in Phase ll. The term "unexpected" reductions compares with what water deliveries are expected within the calendar year. Actual deliveries are compared with scheduled deliveries based on monthly estimates of snowpack and other factors.
4. **Levees:** KIM: a way to express the work needed to get a given levee to meet the ROD's PL84-99 standard.

**Panel Discussion following the subgroup presentations:**

- D. Patten: It is important to think in terms of linkages between these four groups. Is there any conceptual model that overrides these individual efforts? How do the different programs relate to each other? Are there any overriding principles?
- B. Glaze: With water quality, it is not clear how the system is defined – it has to be broader than just the Delta. How can ELPH substitute for the bromide/TOC standards? What is happening with the ELPH study? It is not clear which other PMs were considered but rejected. If these choices are based on the availability of information, why were others left out for 2008? Issues such as pathogens and pesticides should be included. It's understood there are not enough human resources to carry all this out, but we shouldn't just drop the other PMs. We need to put out a strong message to acquire the necessary data. Would the water that flows through the Delta be measured by what we have listed?
- D. Spath; We considered these other performance measures, but we opted for the easier ones – the ones for which we had data.

- A. Pawley: Has the environmental water quality program disappeared? The information seems to have been lost.
- K. Larsen: Environmental water quality has never really had a home. The Regional Boards are not at the ERP table.
- A. Pawley: Water Quality Control Board has no seat at the table with ERP, so the focus has remained on drinking water quality. There is a need for more collaboration.
- S. Luoma: By the looks of things, there will be more San Joaquin River water going to the Delta than Sacramento River water in the future. The next phase should look more into these types of future scenarios whereby there will be an increase in certain constituents such as selenium.
- J. Meyer: The proposed PMs come from regulatory demands on the agencies. What's missing is a step away from that to think more broadly about the system and explaining new methodologies. In addition, we can learn from what is being done at the Everglades
- (http://www.evergladesplan.org/pm/recover/recover.aspx)

**What we can learn from the Everglades:**

- Don't focus on individual PMs, but rather apply a hypothesis-based approach with a suite of measures that are linked to an understanding of the system and impacts of management actions.
- Use interim goals and targets.
- In Florida, they divided the area into regions - could we do this with the Delta and think about regional dimensions? Their regional metric includes the extent of critical plants like bulrush, and they look at the ratio of submerged aquatic vegetation to phytoplankton. They have investigated Nitrogen/phosphorus ratios.
- They have bigger-scale, integrative measures that are lacking in the CALFED process.
- They do an assessment of the food-web. For example, they look at production in the pelagic zone, and look at macro-invertebrates, and nursery ground function.
- Pawley: A similar process like this began years ago with the entire region. There are reports that resulted from this that were not carried forward.
- L. Hastings: In this effort, we are focusing on a core group of performance measures. It is better to have a small number of PMs implemented top-to-bottom than to get overwhelmed. This has never been done before. Seeing an example of full vertical integration will help the agencies with this work. Previous efforts have listed a large number of performance measures, but haven't fully implemented any of them.
- B. Glaze: We see the value in that, but where we are with developing the system, we need more completeness. With a whole new scenario, a few PMs will not be enough.
- J. Keller: The system is problematic due to engineered solutions in place to achieve human goals. The KIM standard needs more richness to give a more comprehensive evaluation of the levee system for all aspects of the Delta. Also, the performance measure associated with anomalies was not discussed. How do we get an integrated approach that explains the inconvenient effects of manipulating the system for water deliveries? The levee performance measures are really "bean

counting", and don't take into account the outcomes of doing a specific action. We need a more integrated approach – we can't just think of the four legs of a stool – we need to figure out how we are going to get a seat on it.

- B. Glaze: Agency participation with stakeholders is good, but the big problem is the lack of overarching governance.
- D Patten: Please correct us if some of our comments are off-base. Hasn't this work with WSR records been done? CALSIM does not have a particular Water Year statistic compared with the full record.
- J. Meyer: Does the levee integrity PMs include seismicity? B Burkhard: There are unforeseen hazards with seismicity. There is a liquefaction hazard throughout the Delta, and peat soils have unforeseen properties.
- A. Pawley: Is the issue of levee setbacks still addressed? B. Burkhard: We wish we could do more of that.
- T. Cannon: The agency process is too insular. Encourage agencies to go beyond their own issues. The Phase 1 products are too inadequate to address our condition. How does this event address how different the Phase ll product will be?
- E. Soderstrom: The idea of this workshop is to get input on Phase ll. The approach for Phase ll is not set in stone.
- J. Meyer: Who is assigned to an integration role? You need a "big picture" role that even a stakeholder process doesn't provide.
- L. Hastings: This integration effort needs help from the Science Program. Help from ISB is welcome.
- D. Spath: The Science Program has been discussing integration, but we need the resources to further the integration. It has gone nowhere. The consequence of implementing a subset of PMs is due to limited resources and the lack of integration.
- D. Patten: ERP had a Science Board that put together a report on PMs. These are not new; the attempt to organize them is new.

**Afternoon Session – Beyond CMARP: Sam Luoma**

There is lots of monitoring data, but what's missing is how we tie all this together. We need to develop a framework for developing a monitoring program. The framework would be broad, identifying what the monitoring should involve.

CMARP had 30 different plans, but no real integration and a lack of prioritization.

We must have a mechanism for interpreting the monitoring data; there is a universal shortage of integrated interpretation. We need to know which policy we want to implement the most. A small group of people, linked with others, can make decisions regarding monitoring. Any monitoring program requires trade-offs. It can be helpful to think about financial constraints when designing a monitoring program. Existing programs are also constraints.

Monitoring questions need to be very explicit. Compliance monitoring is not enough; there needs to be monitoring done to prioritize investments, and we need to know the status and trends associated with the system.

It is also important to consider the choice of an overall design for a monitoring program (example: should it be a probabilistic design, targeted study units, or a process design?).

- Question: Must there be only one study design for an area as complex as the Delta?
- S. Luoma: One design should dominate, with another at the margins.

You need to think about every variable. Interpretation can occur at different scales. Remember: "monitoring is forever" like "science is a habit."

Conclusions:
- We must get around the constraints.
- Large stakeholder groups can be given a choice, but must not be relied on to make decisions. A collaborative process shouldn't be used this way.
- A smaller group that interacts with the larger should be used for making the decisions.

**Post-presentation discussion:**
- M. Healey: How would we use this model for CALFED? What kind of structure would it have?
- S. Luoma: This would require different considerations. The framework must have support from the agencies.
- J. Meyer: The interpretations must be closer to the beginning. Many new procedures must be included in this thinking.
- S. Luoma: We can expand parts of the framework for this. It is a process.
- T. Cannon: What are we going to measure to determine success? Look at what we have before asking what we want to know. Is this being done with the PMs we have now? This should be an evolving process.
- S. Luoma: Monitoring and PMs must be integrated. We should understand the system as a whole. There is a lack of integrative questions to bring people together.
- S. Ziglar: There will be a workshop to look into a regional monitoring program for the San Joaquin River. Need to study how to put the disparate monitoring efforts together.
- A. Pawley: PMs must be developed to allow the process to expose the data gaps.

# Break-out Sessions:

## Water Quality:

The Water Quality breakout session began with introductions of the attendees and the facilitator providing an update on Phase II of the Performance Measures Project. The group then took a few minutes to discuss the Data Collection Profile Sheet for one of the measures identified during Phase I of the project and selected for implementation in

Phase II. The metric selected was the ***annual averages of organic carbon at the Delta intakes***.

The group agreed that selecting organic carbon was a good choice and one that needs implementation. However, experts attending the session disagreed with using annual averages as a valid metric and also had significant concerns regarding focusing solely on drinking water quality and disregarding the impact of organic carbon on ecosystem health. Attendees recommended modifying the measure to say "number of times exceeded during a given year", rather than "annual averages". Delta intakes was also considered too broad and should be focused on specific regions; i.e., Sacramento River, San Joaquin River, North Bay Aqueduct, etc. There was also discussion to change the measure completely in order to improve its value to the program. Changing the measure to "The level of organic carbon in the Delta that is appropriate for sensitive species and provide quality for drinking water purposes" was proposed.

In closing the group recommended considering the following actions:

- Modify the measure to make it more valid and valuable to CALFED
- Use the CALFED Science Program Sample Model as a guide
- Design an effective monitoring system for the measure
- Focus on the what, where, and when during Phase ll and concentrate on reporting later
- Develop conceptual models

**ERP:**

The ERP Subgroup is considering reporting on three PMs for Phase II. These include: Delta Smelt, Lange's Metalmark Butterfly, and spring run Chinook.

Delta Smelt

- We are considering two metrics – Delta smelt viability and habitat suitability, both of which will be based on the Fish and Game mid-water trawl data.
- The Recovery Plan will develop recovery criteria for recovery of Delta smelt.
- The metric for viability will be relative abundance or frequency of occurrence.
- The metric for habitat will be a habitat index that includes salinity and turbidity
- It is difficult to track Delta smelt because the numbers are so low.
- Issues/Dependencies - Entrainment, Invasives, Habitat Identification, Water Year, Food Web, Restoration efforts, Recovery Plan.
- See Bill Bennett Paper. A DRERIP conceptual model is underway, but will need a peer review.
- Target – less that 5% chance of extinction within 100 yrs.

Discussion:

Perhaps because the numbers are so low for Delta smelt, it might make sense to consider another PM more related to overall ecosystem health.

Food Web support is not part of the habitat index. Perhaps it might make sense to consider a PM for food. If food is considered a limiting factor for Delta smelt seen through the conceptual model, then perhaps we will include it.

USFWS is doing a "threat assessment" as part of the recovery plan.

Metalmark Butterfly
- Critically-endangered upland species, rare species with rare habitat.
- Two acres might not be enough to achieve MVP.
- We will use population viability analysis (PVA) instead of MVP.

Discussion:

Consider Striped Bass vs. Smelt as an ERP performance measure since not part of a recovery effort.

Why were other ecosystem restoration performance measures such as habitat restoration not chosen?

**Levees:**
J. Keller: Suggestion: Modify the KIM to provide more richness. Provide an estimate for total volume (total height of inside slope*inches*miles). This reduces the variability with levee integrity instead of assuming a width. This will more closely estimate true volume. Once these dimensions are calculated, multiply them by a risk factor to get an RKIM

- The RKIM can be flavored based on the asset risk, possibly reported as a scale from one to ten.
- The adaptive management process for levees involves how people react to our actions.
- Keep the probability of failure and consequences of failure separate.
- ACOE data does not take into account Delta issues. Their project levees are upstream of the Delta.
- J. Keller: Seismic risk: seismic failures are random and devastating. It is impossible to rebuild a levee into a safe seismic state. Here it is just a matter of dealing with the situation.
- We can get help from the ACOE on probability of failure issues (contact: Russ Rote).
- Conceptual models need some reinforcement.
- Run different levee protection/levee failure scenarios and estimate the associated costs.

**Water Supply Reliability:**
- J. Keller: Supply/no supply is a driver for the other areas (ERP, W/Q). Use their conceptual models to capture the needs within their own systems.
- The current PMs put us in a weak position, as the main issue is "will we pump as much as we are supposed to". This does not speak to how we are affecting the Delta. It does not address how we are serving the Delta by the way we are currently

pumping water. We can also talk a little more about the consequences of failure and the benefits of delivery.

- This is a manipulative science. Ecologists need to know what happens if water supply deliveries change. We will not be "stepping into their area" if we look at these issues from the water supply sector.

For PM #1: "Annual number of incidences when water quality standards, flow requirements, or other agreements related to SWP operations throughout the Delta are not met":

- This PM can be fleshed out and expanded to help understand, for example, the *consequences* of when flow requirements are not met.

Data Issues:

- For PM #1, there are no material issues with data availability. Possibly link project water quality information with environmental water quality to see how they relate to project operations.

PM #2: "Acre-feet of unexpected reductions in SWP water supplies for a given year":

- There is data available. Can existing data serve new criteria and scenarios? You can look at both scenarios and put a cost associated with the change, and describe the costs of each change.

PM #3: "Acre-feet of SWP water supplies in a water year with a description of the conditions during the water year":

- There is data from the historical hydrology, but this does not reflect future effects from climate change.
- DSM ll and CALSIM ll models are essentially in place.